

Lower Extremity Osteoarthritis: Management and Challenges

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Osteoarthritis is the most common form of arthritis, a significant contributor to disability and the major cause for joint replacements, but treatment for the disease is still limited. Although no disease-modifying treatments exist, there are evidence-based algorithms and guidelines for the symptomatic treatment of the disease.

Osteoarthritis (OA) is the most common form of arthritis, with an estimated prevalence of more than 27 million people in the United States [1]. This disease has a significant socioeconomic impact, as it is one of the leading causes of disability and more than two thirds of people with OA are of working age (between 15-64 years of age) [2].

OA was previously thought to be “a wear and tear” arthritis; however, this is an oversimplified view of a very complex disease. There are many contributors to the development of OA, including mechanical stresses from abnormal joint alignment, obesity, genetics, trauma, local and systemic inflammation, and aging, among others [3]. Current understanding is that low-grade inflammation plays a major role in the development of OA, regardless of the inciting factor [4]. This heterogeneity of the disease, and the variety of initiating causes leading to different clinical phenotypes, makes OA a very difficult disease to treat.

OA of the lower extremity is of increasing interest, partly due to growing numbers of joint replacements. In 2014, OA accounted for 79% of the 1.3 million total arthroplasties performed in the United States (about 90% of knee and 64% of hip arthroplasties [5]), numbers that are expected to dramatically increase [6]. OA of the lower extremities also affects mobility and puts people at increased risk for falls [7] and subsequent morbidity and mortality. OA of the foot and ankle is also important but understudied.

Management of Osteoarthritis

Our group recently published a systematic review of recommendations and guidelines from several international specialty societies for the management of OA, including non-pharmacologic and pharmacologic treatment options [8]. A combination of non-pharmacologic and pharmacologic approaches is needed for patients with OA (see Table 1). Non-pharmacologic treatment options such as education, exercise and weight loss, assistive devices, alternative

TABLE 1.
Summary of Recommendations for Management of Osteoarthritis

Core recommendations (always recommended):
✓ Self-management programs
✓ Education
✓ Individualized treatment plans
✓ Weight loss or maintenance
✓ Exercise (land or water-based)
Recommended for most situations (if appropriate for clinical situation, comorbidities):
✓ Intra-articular corticosteroid injection
✓ Topical non-steroidal anti-inflammatory medications (NSAIDs)
✓ Acetaminophen
✓ Oral NSAIDs or COX-2 inhibitors
✓ Walking aids and assistive devices
✓ Thermal modalities
✓ Physical or occupational therapy referral
Consider in some situations (eg, specific patient populations or presentations):
✓ Duloxetine
✓ Capsaicin
✓ Mind and body therapies (eg, yoga, Tai Chi, acupuncture)
✓ Splinting and bracing
✓ Transcutaneous electrical nerve stimulation
✓ Surgical intervention (specifically joint replacement)
Not recommended:
☒ Therapeutic ultrasound
☒ Needle lavage
☒ Arthroscopy with debridement
Controversial across guidelines, insufficient data, or not addressed:
• Intra-articular hyaluronic acid injection
• Other intra-articular treatments (eg, platelet rich plasma, stem cells)
• Glucosamine/chondroitin
• Other surgical interventions (eg, osteotomy, partial joint replacement)
• Herbal or botanical treatments

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approaches, and surgical interventions were evaluated and are summarized here.

Non-pharmacologic management

All patients should receive education about OA, its clinical manifestations and prognosis, as well as joint protection strategies and self-care. Plans for self-management should be tailored to each patient based on individual ability and any restrictions to activities of daily living [8]. Other non-pharmacologic interventions such as assistive devices, bracing,

and taping should be individualized to each person's needs. There is inconclusive evidence for lateral heel wedges and bracing; however, these could be considered as adjunctive therapy. Walking aids (eg, canes, crutches, walkers) should be considered to increase autonomy and facilitate activities of daily living. Thermal modalities (eg, application of heat or ice) have been found useful for people with hip and knee OA. Currently, there is limited support for transcutaneous electrical nerve stimulation or mind and body practices such as acupuncture and Tai Chi, although some evidence exists

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and these approaches may be good options for interested patients [8].

There are strong recommendations for exercise and weight loss, particularly for OA of the hips and knees, across all guidelines. Exercise can be land-based or aquatic, and should be focused on low-impact aerobic exercises.

Strengthening exercises can also be helpful, as well as referral to physical therapy and occupational therapy [8]. Several evidence-based programs are available, both in self-directed and group formats (eg, through the Arthritis Foundation, at <http://resourcefinder.arthritis.org/>). The beneficial impact of weight loss and exercise on OA has been corroborated in

randomized controlled trials such as the IDEA trial [9]. This trial evaluated the impact of intensive diet and exercise on knee OA over an 18-month period and found that the combination of diet-induced weight loss (10% from baseline) and regular exercise decreased pain by more than 50%, while also demonstrating beneficial effects on joint loads and inflammation.

Surgical Management

As far as surgical interventions are concerned, arthroscopy with debridement is not recommended for the management of symptomatic knee OA, and recent work suggests that arthroscopic partial meniscectomy is not beneficial for degenerative meniscal changes [10]. However, joint replacement is indicated for symptomatic OA that is not amenable to non-surgical interventions [8]. Cost-effectiveness for total knee replacement has been found to be greater if reserved to people who are more severely affected by knee OA [11].

Pharmacologic Management

In regard to pharmacologic management, first-line treatment generally includes acetaminophen (although more recent evidence suggests minimal efficacy [12]) followed by topical and oral NSAIDs. Of the topical NSAIDs, diclofenac and ketoprofen are safe and provide modest improvements in pain over placebo [13]. For people at increased risk for gastrointestinal issues (due to age, prior diagnosis of ulcer disease, or medication interactions), proton-pump inhibitors can be used in conjunction with oral NSAIDs, or COX-2 specific NSAIDs can be considered [8]. Celecoxib, the only COX-2 selective NSAID currently available in the United States, was found to have similar efficacy but a significantly lower risk for gastrointestinal side effects compared with naproxen or ibuprofen in the recently published PRECISION trial [14]. Tramadol and opioids can be used for refractory pain (with appropriate discussion of risks and benefit, particularly given new guidelines for opioid use and chronic pain [15]), and duloxetine has been shown to improve chronic symptoms related to OA. Ibuprofen-containing followed by naproxen-containing regimens may be cost-saving compared to celecoxib or tramadol for people with both OA and comorbidities [16].

Intra-articular steroids can be helpful in knee and hip OA [17], but most guidelines reported insufficient evidence for intra-articular hyaluronans (hyaluronic acid) [8]. Use of hyaluronans has also been associated with significant cost to the healthcare system and can account for more than a quarter of OA treatment-specific payments [18].

Treatment Algorithms

Clinical algorithms for OA using this evidence base have also been published [19]. These algorithms were established by a panel of 15 OA health professionals from 8 different countries, with the goal of providing treat-

ment recommendations in a more user-friendly format to improve uptake of evidence-based practices. The algorithms initially focus on conservative and less-costly treatments and favor initial management for hip and knee OA focused on self-management, exercise, and weight loss. Pharmacologic treatment with acetaminophen or NSAIDs (topical or oral) should be considered in conjunction with non-pharmacologic therapy. Physical therapy and occupational therapy can be offered if the patient has functional deficits, and orthoses may be helpful if activities of daily living are impaired. If patients progress to have disabling disease despite the more conservative management, opioids for short-term use and intra-articular steroids can be used. If symptoms continue to progress beyond those interventions, then surgical options may need to be considered.

Challenges and Future Directions

Several new treatments for OA are currently under study [20], including: anti-nerve growth factor agents, which have been very promising for treating OA pain; longer-acting steroids for intra-articular therapy; and other novel intra-articular treatments that may provide symptom or structure modification. However, treating OA at the present time can be frustrating, as there is no treatment thus far that can reverse or modify the disease process. As a health care provider, it can be difficult to discuss with our patients the limitations that we have in our current treatment options. While we know that diet-induced weight loss coupled with exercise can significantly improve pain in patients with OA, it is important to be able to recognize that these are interventions that are not easily implemented or maintained.

At this time, setting realistic expectations for patients, coming up with tailored plans based on their abilities, and educating them about the disease process is helpful. As we gather more insight on the disease, we hope to eventually have treatment that can be disease-modifying. **NCMJ**

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